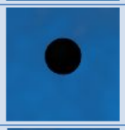
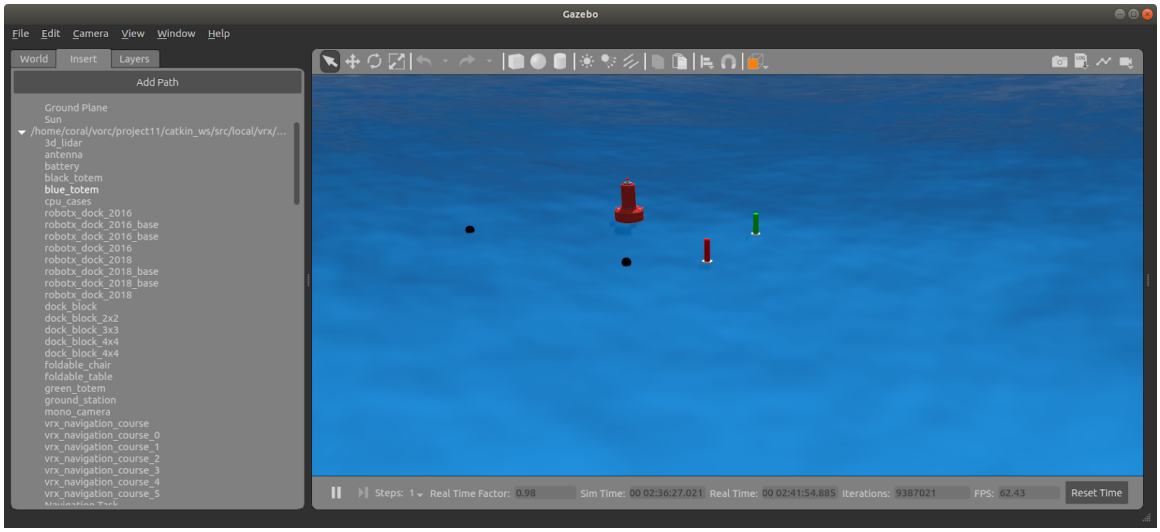
Something to keep in mind:

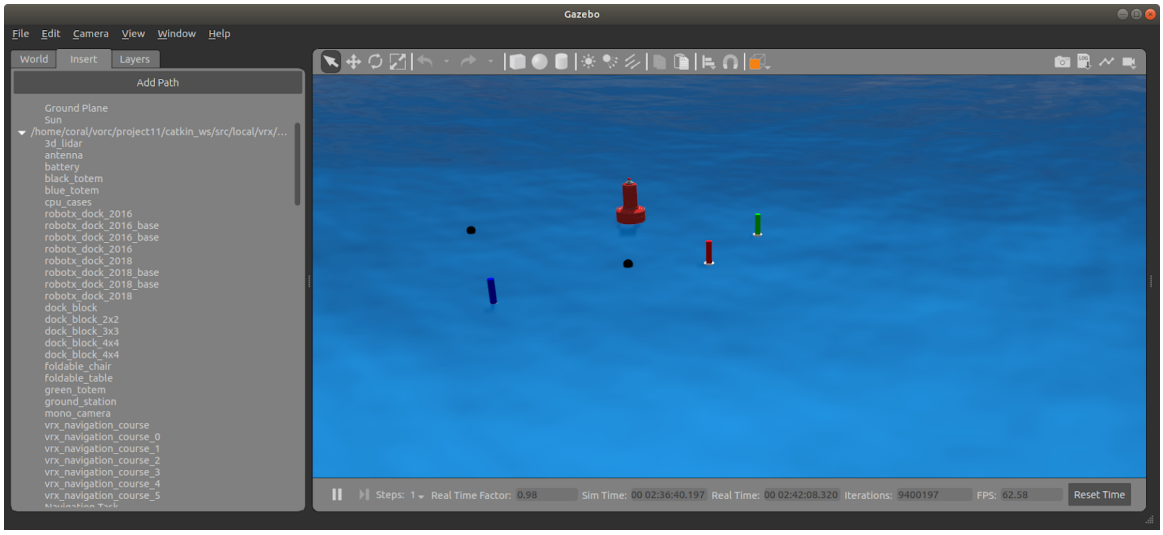
1. **Data collection:**
   a. The classes are taken from:
      There are 2 options and we need to agree upon only 1 option:
      File “classes.txt” contains all 12 classes.
      File “classes-10.txt” contains 10 classes (all polyforms are considered one class)

Table 6: List of 3D objects to be considered in Task 3

3D object	Identification String	3D object	Identification String
	yellow_totem		polyform_a3
	black_totem		polyform_a5
	blue_totem		polyform_a7
	green_totem		surmark46104
	red_totem		surmark950400
	buoy_red		surmark950410

   b. Run the simulation with the marina setup in Gazebo.
   c. Insert the objects: go to the ‘insert’ tab > double click on the object > move with the mouse to the simulated environment and place the object by pressing the left button.





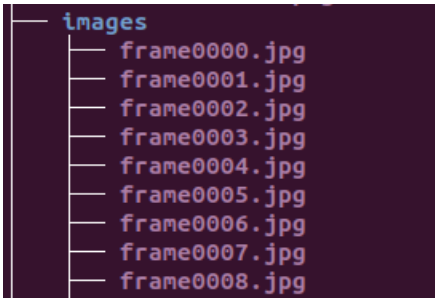
d. When ready to record images, in a terminal windo:
   i. cd [desired_directory_to_save_images] , e.g: ~/vorc/log/images/
   ii. Then run the command (http://wiki.ros.org/image_view) :

   rosrun image_view extract_images image:=/cora/sensors/cameras/front_left_camera/image_raw _sec_per_frame:=0.5 _filename_format:=image%04d.jpg

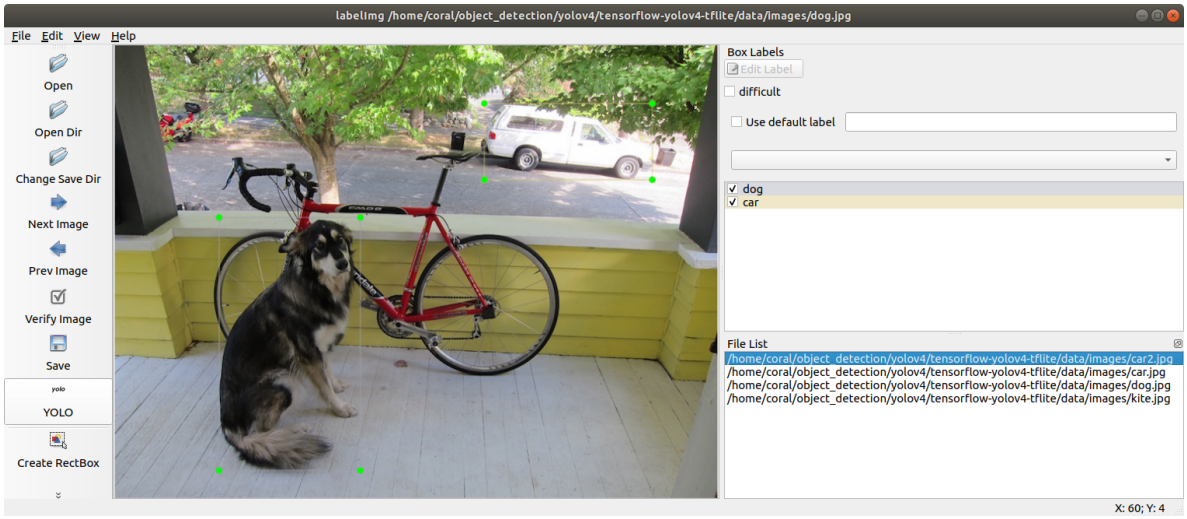
   parameters:
   ~filename_format (string, default: frame%04d.jpg)
   File name for saved images, you must add use '%04i' for sequence number.
e. Make sure you cover different conditions:
   Different backgrounds, distances, light and fog conditions

2. **Data annotation - LabelImg:**

Follow the installation instructions: https://github.com/tzutalin/labelImg
Note: It is enough to install the latest packages: python3, sip, pyqt5, lxml.
All images and annotations are in the same folder. For example:



a. cd [labelImag directory]
b. python3 labelImg.py [IMAGE_PATH] [PRE-DEFINED CLASS FILE]
c. Right below "Save" button in the toolbar, click "PascalVOC" button to switch to YOLO format.



d. Create RectBox > choose a class > after annotating all the objects in the image press “save”
e. A txt file of YOLO format will be saved in the same folder as your image with same name. A file named "classes.txt" is saved to that folder too. "classes.txt" defines the list of class names that your YOLO label refers to.
f. Note:
    i. Your label list shall not change in the middle of processing a list of images. When you save an image, classes.txt will also get updated, while previous annotations will not be updated.
    ii. You shouldn't use "default class" function when saving to YOLO format, it will not be referred.
    iii. When saving as YOLO format, "difficult" flag is discarded.

iv. SAVE IMAGES EVEN WITH NO ANNOTATIONS IN IT, that is an empty *.txt file.

3. **Training custom YOLOv4 object detector with darknet**
   ** TO DO **
   Working on Jupiter notebook (to run on a local machine) / collaboratory (to run in the cloud) guideline

4. **ROS integration**
   Using https://github.com/coral26/yolov4-for-darknet_ros